

4. DSC-PO with motor

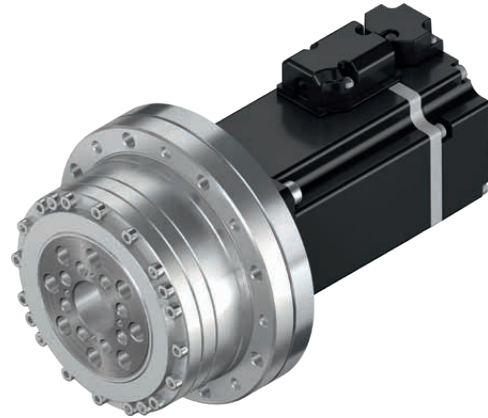
The motor adapters for the DATORKER® strain wave gear type DSC-PO allow a simple and compact connection of the HIWIN servo motors together with the HIWIN drive amplifiers and all necessary cables.

Main features:

- Compact
- High precision
- Easy assembly
- Complete system
- Motors with and without brake
- 23 bit absolute (multiturn encoder)
- Step direction, EtherCAT (CoE)

Typical applications:

- Rotary/swivel axis
- Rotary tables
- Robot axes



4.1 Technical data

4.1.1 Specification Table

Table 4.1 Specification Table

Model/size	Reduction Ratio	Peak torque at start/stop [Nm]	Maximum speed [rpm]	Rated speed [rpm]
DSC20 with 200 W motor	50	56	120	60
	80	74	75	37
	100	82	60	30
DSC25 with 400 W motor	50	98	112	60
	80	137	70	37
	100	157	56	30
DSC32 with 750 W motor	50	216	96	60
	80	304	60	37
	100	333	48	30

Table 4.2 Specification Table (continued)

Model/size	Maximum current [A]	Rated current [A]	Maximum tilting moment [Nm]	Moment rigidity [$\times 10^4$ Nm/rad]	Positioning accuracy [arcsec]	Repeating accuracy [arcsec]	Weight [kg]
DSC20 with 200 W motor	6.4	1.60	91	12.8	< 60	< ± 6	2.3 (2.6)
DSC25 with 400 W motor	10.0	2.50	156	24.2			3.3 (3.9)
DSC32 with 750 W motor	18.6	4.65	313	53.9			6.9 (7.6)

Values in brackets apply to model with motor brake

DATORKER® strain wave gears

DSC-PO with motor

4.2 Dimensions

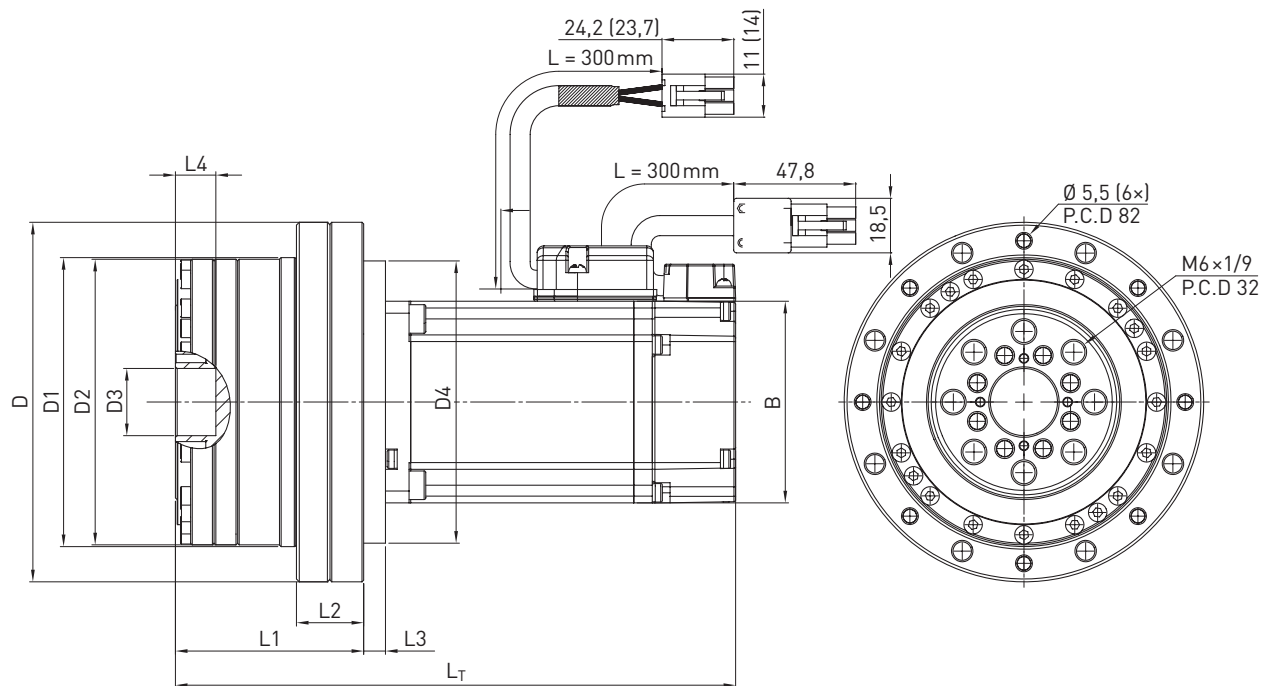


Table 4.3 Dimensions

Model/size	L _T	L ₁	L ₂	L ₃	L ₄
DSC20 with 200 W motor	141.9 (171.9)	54.4	26.4	2.0	9
DSC25 with 400 W motor	166.7 (196.7)	56.0	20.0	6.5	12
DSC32 with 750 W motor	203.3 (230.3)	77.5	32.5	3.5	15

Values in brackets apply to model with motor brake

Table 4.4 Dimensions (continued)

Model/size	D	D ₁	D ₂	D ₃	D ₄	B
DSC20 with 200 W motor	93	72 ⁰ _{-0.03}	70	14 ^{+0.018} ₀	80 ^{-0.01} _{-0.03}	60
DSC25 with 400 W motor	107	86 ⁰ _{-0.035}	85	20 ^{+0.021} ₀	84 ^{-0.01} _{-0.03}	60
DSC32 with 750 W motor	138	113 ⁰ _{-0.035}	112	26 ^{+0.021} ₀	108 ^{-0.01} _{-0.03}	80

5. DSC-P0

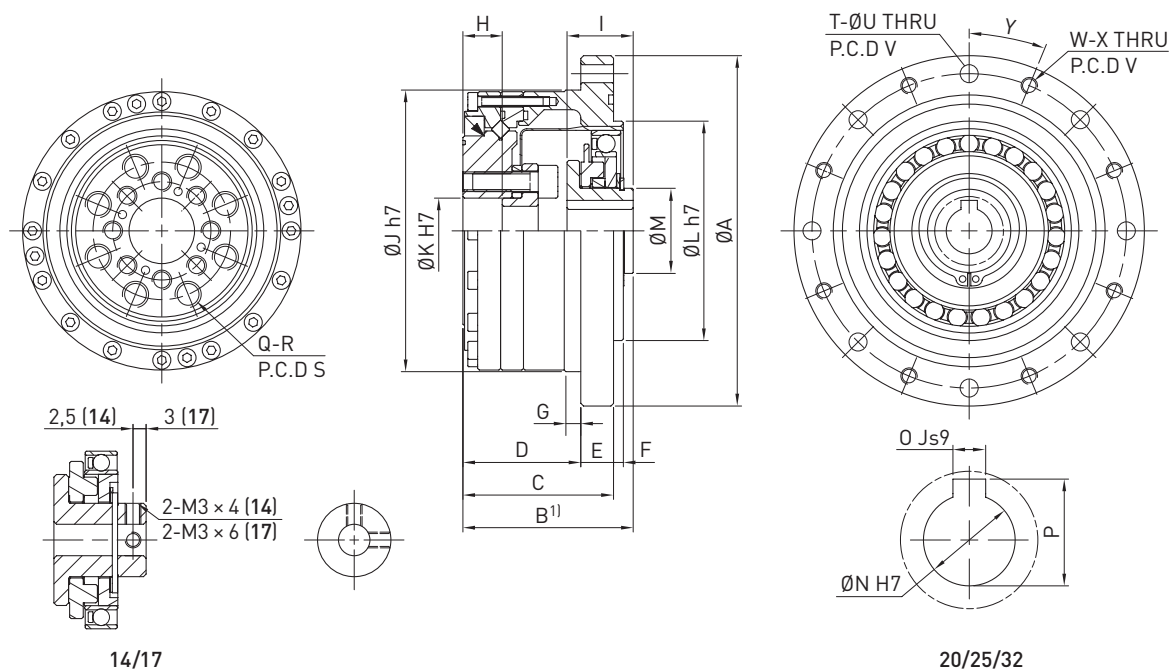


Table 5.1 Dimensions of DSC-P0 strain wave gears

	Unit	Model/size				
		14	17	20	25	32
ØA	mm	73	79	93	107	138
B ¹⁾	mm	41.0 _{-0.9}	45.0 _{-0.9}	45.5 _{-1.0}	52.0 _{-1.0}	62.0 _{-1.1}
C	mm	34	37	38	46	57
D	mm	27	29	28	36	45
E	mm	7.0	8.0	10.0	10.0	12.0
F	mm	2	2	3	3	3
G	mm	3.5	4.0	5.0	5.0	5.0
H	mm	9.4	9.5	9.0	12.0	15.0
I	mm	17.6 _{-0.1}	19.5 _{-0.1}	20.1 _{-0.1}	20.2 _{-0.1}	22.0 _{-0.1}
ØJ h7	mm	56	63	72	86	113
ØK H7	mm	11	10	14	20	26
ØL h7	mm	38	48	56	67	90
ØM	mm	14	18	21	26	26
ØN H7	mm	6	8	12	14	14
O Js9	mm	—	—	4	5	5
P	mm	—	—	13.8 ^{+0.1}	16.3 ^{+0.1}	16.3 ^{+0.1}
Q	mm	6	6	8	8	8
R	mm	M4 × 8DP	M5 × 10DP	M6 × 9DP	M8 × 12DP	M10 × 15DP
S (P.C.D)	mm	23	27	32	42	55
T	mm	6	6	6	8	12
ØU	mm	4.5	4.5	5.5	5.5	6.6
V (P.C.D)	mm	65	71	82	96	125
W	mm	6	6	6	8	12
X	mm	M4	M4	M5	M5	M6
Y	Degree	30	30	30	22.5	15
Moment of inertia	×10 ⁻⁴ kgm ²	0.033	0.079	0.193	0.413	1.690
Weight	kg	0.52	0.68	0.98	1.50	3.20

¹⁾ B is the tolerance and the matching position of axial direction.

DATORKER® strain wave gears

DSC-PO

5.1 DSC-PO design

5.1.1 Technical data

Table 5.2 Crossed roller bearing specifications						
Model/size	Centre circle diameter of the rollers	Offset	Basic load ratings		Permitted torque	Moment rigidity
	Dpw	R	Dynamic load C _{dyn}	Static load C ₀		
	m	m	kN	kN	Nm	×10 ⁴ Nm/rad
14	0.0350	0.0095	4.7	6.1	41	4.38
17	0.0425	0.0095	5.3	7.6	64	7.75
20	0.0500	0.0095	5.8	9.0	91	12.80
25	0.0620	0.0115	9.6	15.1	156	24.20
32	0.0800	0.0130	15.0	25.0	313	53.90

Table 5.3 Accuracy of angular transmission						
Reduction ratio		Model/size				
		14	17	20	25	32
50 – 160	×10 ⁻⁴ rad	4.4	4.4	2.9	2.9	2.9

Table 5.4 Hysteresis loss						
Reduction ratio		Model/size				
		14	17	20	25	32
50	×10 ⁻⁴ rad	5.8	5.8	5.8	5.8	5.8
80 – 160	×10 ⁻⁴ rad	2.9	2.9	2.9	2.9	2.9

Table 5.5 Starting torque					
Reduction ratio		Model/size			
		14	17	20	32
50		4.1	6.1	7.8	15.0
80		2.8	4.0	4.9	9.2
100		2.5	3.4	4.3	8.0
120		—	3.1	3.8	7.3
160		—	—	3.3	6.3

Unit: cNm

Note: The values in this table vary depending on the working conditions and are for reference purposes only. The upper limit is 20% above the value in this table.

Table 5.6 Reverse starting torque					
Reduction ratio		Model/size			
		14	17	20	32
50		1.6	3.0	4.7	9.0
80		1.6	3.0	4.8	9.1
100		1.8	3.3	5.1	9.8
120		—	3.5	5.5	11.0
160		—	—	6.4	13.0

Unit: Nm

Note: The values in this table vary depending on the working conditions and are for reference purposes only. The upper limit is 20% above the value in this table.

Table 5.7 Torsional rigidity

Reduction ratio			Model/size				
			14	17	20	25	32
T1	Nm		2.0	3.9	7.0	14.0	29.0
T2	Nm		6.9	12.0	25.0	48.0	108.0
50	K_1	$\times 10^4$ Nm/rad	0.34	0.81	1.30	2.50	5.40
	K_2	$\times 10^4$ Nm/rad	0.47	1.10	1.80	3.40	7.80
	K_3	$\times 10^4$ Nm/rad	0.57	1.30	2.30	4.40	9.80
	θ_1	$\times 10^{-4}$ rad	5.8	4.9	5.2	5.5	5.5
	θ_2	$\times 10^{-4}$ rad	16.0	12.0	15.4	15.7	15.7
80 – 160	K_1	$\times 10^4$ Nm/rad	0.47	1.00	1.60	3.10	6.70
	K_2	$\times 10^4$ Nm/rad	0.61	1.40	2.50	5.00	11.00
	K_3	$\times 10^4$ Nm/rad	0.71	1.60	2.90	5.70	12.00
	θ_1	$\times 10^{-4}$ rad	4.1	3.9	4.4	4.4	4.4
	θ_2	$\times 10^{-4}$ rad	12.0	9.7	11.3	11.1	11.6

The values are for reference purposes only. The lower limit is 20 % below the value in this table.

5.1.2 Efficiency E_R

The efficiency of DATORKER® shaft gear units changes depending on the specification, load ratio, operating conditions (speed/load) and lubrication (lubricant type/amount).

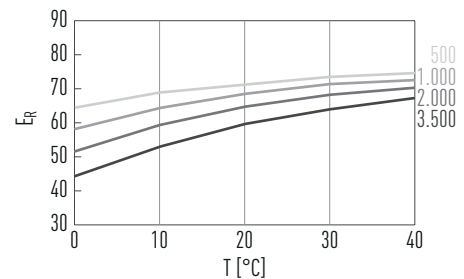
E_R Efficiency at nominal torque

T Temperature

Unit: rpm

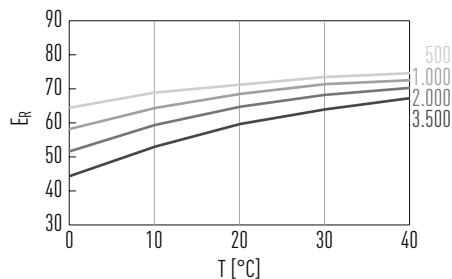
Model: 14

Ratio: 50



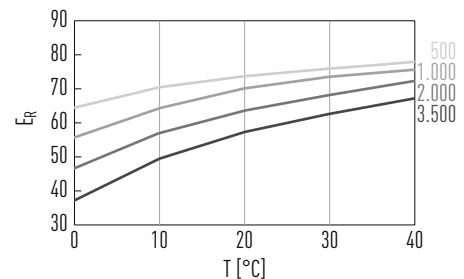
Model: 14

Ratio: 80



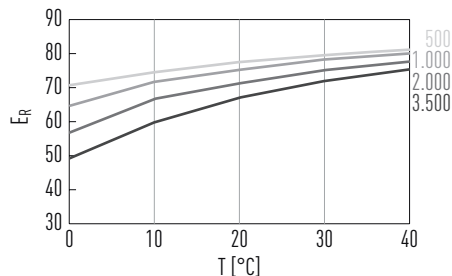
Model: 14

Ratio: 100



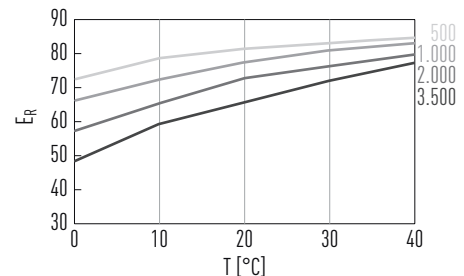
Model: 17-32

Ratio: 50



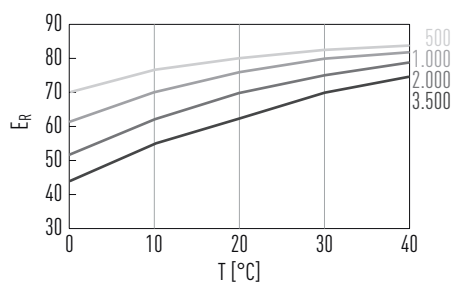
Model: 17-32

Ratio: 80, 100



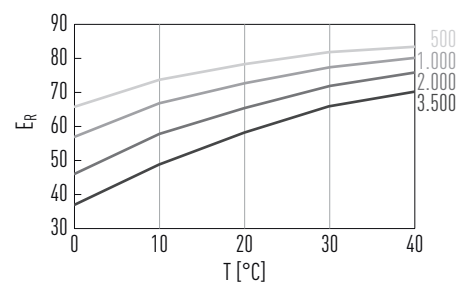
Model: 17-32

Ratio: 120



Model: 20-32

Ratio: 160



DATORKER® strain wave gears

DSC-PO

Correction coefficient α

Efficiency = $\alpha \times E_R$

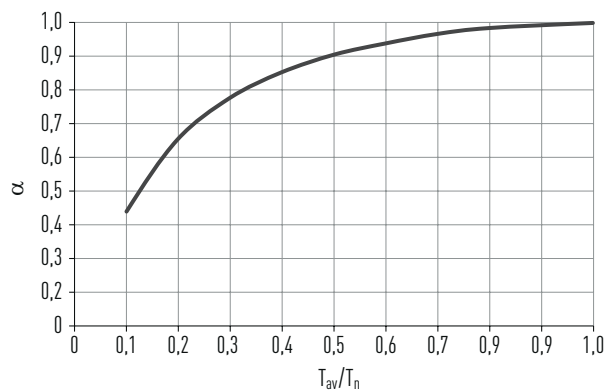
α Correction coefficient

E_R Efficiency at nominal torque

T_{av} Average load torque

T_n Rated torque

T_{av}/T_n Torque ratio



5.1.3 Idling operating torque

The idling operating torque is the torque required to drive the DATORKER® shaft gear input (high speed end) after more than 2 hours at an input speed of 2,000 rpm at an average ambient temperature of 25 °C without load.

Table 5.8 Idling operating torque

Reduction ratio	Input speed [rpm]	Model/size				
		14	17	20	25	32
50	500	3.2	5.1	7.3	12.8	26.1
	1,000	3.9	6.1	9.1	17.8	33.1
	2,000	4.6	7.6	11.8	21.8	44.1
	3,500	5.9	9.6	12.7	28.8	57.1
80	500	2.3	3.8	5.5	9.7	20.3
	1,000	3.0	4.8	7.3	14.7	27.3
	2,000	3.7	6.3	10.0	18.7	38.3
	3,500	5.0	8.3	10.9	25.7	51.3
100	500	2.1	3.5	5.0	9.0	19.0
	1,000	2.8	4.5	6.8	14.0	26.0
	2,000	3.5	6.0	9.5	18.0	37.0
	3,500	4.8	8.0	10.4	25.0	50.0
120	500	—	3.3	4.7	8.5	18.1
	1,000	—	4.3	6.5	13.5	25.1
	2,000	—	5.8	9.2	17.5	36.1
	3,500	—	7.8	10.1	24.5	47.2
160	500	—	—	4.2	7.8	16.8
	1,000	—	—	6.0	12.8	23.8
	2,000	—	—	8.7	16.8	34.8
	3,500	—	—	9.6	23.8	47.8

Unit: cNm

Note: The values in this table vary depending on the working conditions and are for reference purposes only. The upper limit is 20 % above the value in this table.

6. DSC-C0

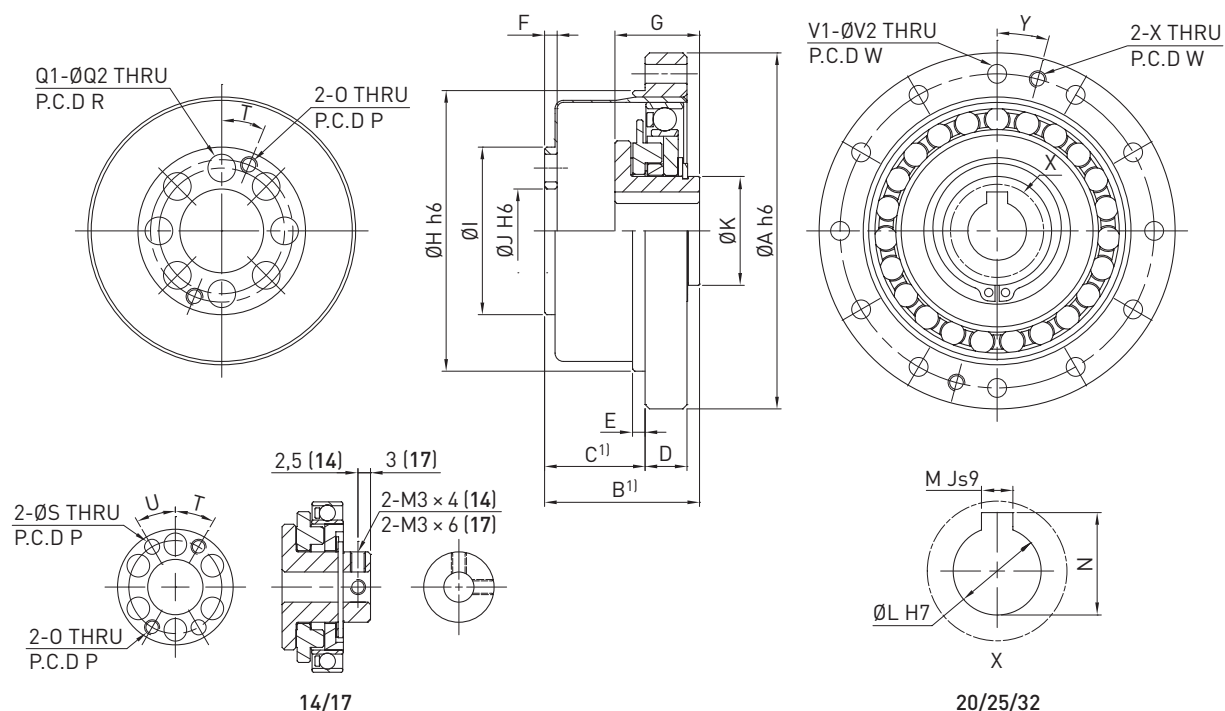


Table 6.1 Dimensions of DSC-C0 strain wave gears

	Unit	Model/size				
		14	17	20	25	32
ØA h6	mm	50	60	70	85	110
B ¹⁾	mm	28.5 ^{-0.8}	32.5 ^{-0.9}	33.5 ^{-1.0}	37.0 ^{-1.0}	44.0 ^{-1.1}
C ¹⁾	mm	17.5 ^{+0.4}	20.0 ^{+0.5}	21.5 ^{+0.6}	24.0 ^{+0.6}	28.0 ^{+0.6}
D	mm	6.0	6.5	7.5	10.0	14.0
E	mm	2.0	2.5	3.0	3.0	3.0
F	mm	2.4	3.0	3.0	3.0	3.2
G	mm	17.6 ^{-0.1}	19.5 ^{-0.1}	20.1 ^{-0.1}	20.2 ^{-0.1}	22.0 ^{-0.1}
ØH h6	mm	38	48	54	67	90
ØI	mm	23.0	27.2	32.0	40.0	52.0
J H6	mm	11	10	16	20	26
ØK	mm	14	18	21	26	26
ØL H7	mm	6	8	9	11	14
M Js9	mm	—	—	3	4	5
N	mm	—	—	10.4 ^{+0.1}	12.8 ^{+0.1}	16.3 ^{+0.1}
O	mm	M3	M3	M3	M4	M5
P (P.C.D)	mm	18.5	21.5	27.0	34.0	45.0
Q1	mm	6	6	8	8	8
ØQ2	mm	4.5	5.5	5.5	6.6	9.0
R (P.C.D)	mm	17	19	24	30	40
S	mm	3.0 ^{+0.015}	3.0 ^{+0.015}	—	—	—
T	Degree	30	30	22.5	22.5	22.5
U	Degree	30	30	—	—	—
V1	mm	6	12	12	12	12
ØV2	mm	3.5	3.5	3.5	4.5	5.5
W (P.C.D)	mm	44	54	62	75	100

¹⁾ B and C is the tolerance and the matching position of axial direction

DATORKER® strain wave gears

DSC-CO

Table 6.1 Dimensions of DSC-CO strain wave gears

	Unit	Model/size				
		14	17	20	25	32
X	mm	M3	M3	M3	M4	M5
Y	Degree	30	15	15	15	15
Moment of inertia	$\times 10^{-4} \text{ kgm}^2$	0.033	0.079	0.193	0.413	1.690
Weight	kg	0.09	0.15	0.28	0.45	0.89

¹⁾ B and C is the tolerance and the matching position of axial direction

6.1 DSC-CO design

6.1.1 Technical data

Table 6.2 Accuracy of angular transmission

Reduction ratio		Model/size				
		14	17	20	25	32
50 – 160	$\times 10^{-4} \text{ rad}$	4.4	4.4	2.9	2.9	2.9

Table 6.3 Hysteresis loss

Reduction ratio		Model/size				
		14	17	20	25	32
50	$\times 10^{-4} \text{ rad}$	5.8	5.8	5.8	5.8	5.8
80 – 160	$\times 10^{-4} \text{ rad}$	2.9	2.9	2.9	2.9	2.9

Table 6.4 Starting torque

Reduction ratio		Model/size				
		14	17	20	25	32
50		3.3	5.1	6.6	12.0	26
80		2.4	3.3	4.1	7.7	16
100		2.1	2.9	3.7	6.9	15
120		—	2.7	3.3	6.3	13
160		—	—	2.9	5.5	12

Unit: cNm

Note: The values in this table vary depending on the working conditions and are for reference purposes only. The upper limit is 20 % above the value in this table.

Table 6.5 Reverse starting torque

Reduction ratio		Model/size				
		14	17	20	25	32
50		1.4	2.5	4.0	7.5	16
80		1.4	2.5	4.2	7.7	16
100		1.7	2.8	4.5	8.4	18
120		—	3.1	4.9	9.2	19
160		—	—	5.8	11	23

Unit: Nm

Note: The values in this table vary depending on the working conditions and are for reference purposes only. The upper limit is 20 % above the value in this table.

Table 6.6 Torsional rigidity

Reduction ratio			Model/size				
			14	17	20	25	32
T1	Nm		2.0	3.9	7.0	14.0	29.0
T2	Nm		6.9	12.0	25.0	48.0	108.0
50	K_1	$\times 10^4$ Nm/rad	0.34	0.81	1.30	2.50	5.40
	K_2	$\times 10^4$ Nm/rad	0.47	1.10	1.80	3.40	7.80
	K_3	$\times 10^4$ Nm/rad	0.57	1.30	2.30	4.40	9.80
	θ_1	$\times 10^{-4}$ rad	5.8	4.9	5.2	5.5	5.5
	θ_2	$\times 10^{-4}$ rad	16.0	12.0	15.4	15.7	15.7
80 – 160	K_1	$\times 10^4$ Nm/rad	0.47	1.00	1.60	3.10	6.70
	K_2	$\times 10^4$ Nm/rad	0.61	1.40	2.50	5.00	11.00
	K_3	$\times 10^4$ Nm/rad	0.71	1.60	2.90	5.70	12.00
	θ_1	$\times 10^{-4}$ rad	4.1	3.9	4.4	4.4	4.4
	θ_2	$\times 10^{-4}$ rad	12.0	9.7	11.3	11.1	11.6

The values are for reference purposes only. The lower limit is 20 % below the value in this table.

6.1.2 Efficiency E_R

The efficiency of DATORKER® shaft gear units changes depending on the specification, load ratio, operating conditions (speed/load) and lubrication (lubricant type/amount).

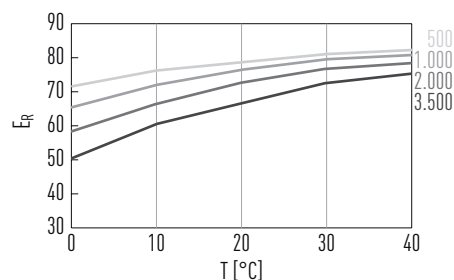
E_R Efficiency at nominal torque

T Temperature

Unit: rpm

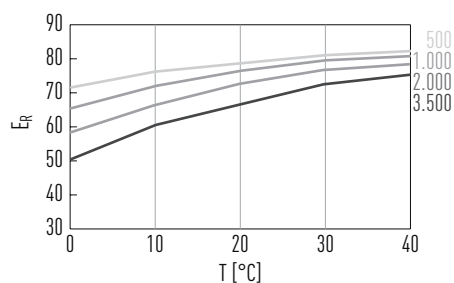
Model: 14

Ratio: 50



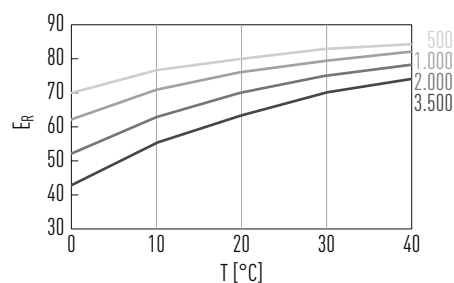
Model: 14

Ratio: 80



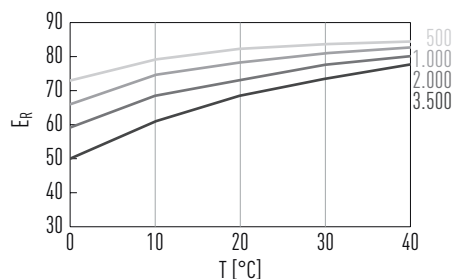
Model: 14

Ratio: 100



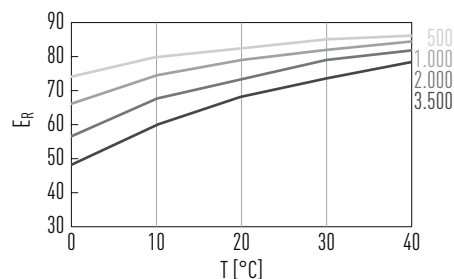
Model: 17-32

Ratio: 50



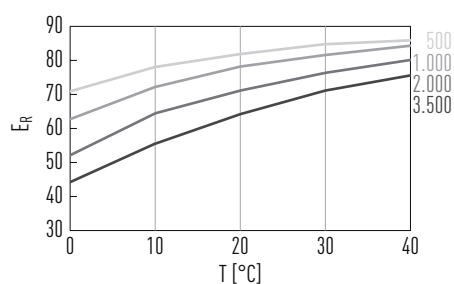
Model: 17-32

Ratio: 80, 100



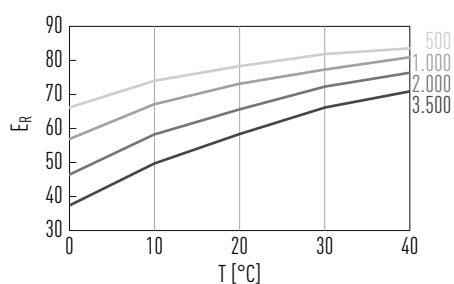
Model: 17-32

Ratio: 120



Model: 20-32

Ratio: 160



DATORKER® strain wave gears

DSC-CO

Correction coefficient α

$$\text{Efficiency} = \alpha \times E_R$$

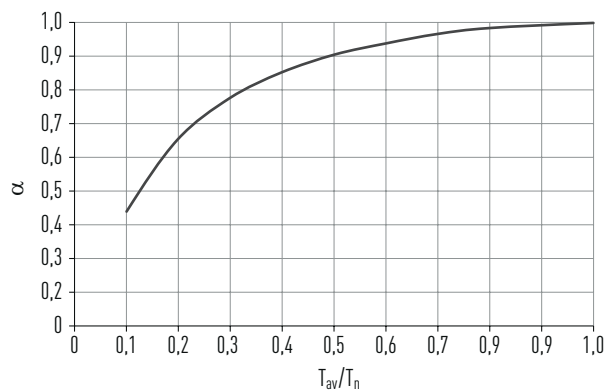
α Correction coefficient

E_R Efficiency at nominal torque

T_{av} Average load torque

T_n Rated torque

T_{av}/T_n Torque ratio



6.1.3 Idling operating torque

The idling operating torque is the torque required to drive the DATORKER® shaft gear input (high speed end) after more than 2 hours at an input speed of 2,000 rpm at an average ambient temperature of 25 °C without load.

Table 6.7 Idling operating torque

Reduction ratio	Input speed [rpm]	Model/size				
		14	17	20	25	32
50	500	1.8	3.4	5.1	9.7	21.2
	1,000	2.3	4.4	6.9	12.5	27.2
	2,000	3.1	5.8	9.4	18.5	37.2
	3,500	4.2	7.9	13.4	25.5	50.2
80	500	1.4	2.6	3.9	7.6	16.8
	1,000	1.9	3.6	5.7	10.4	22.8
	2,000	2.7	5.0	8.2	16.4	32.8
	3,500	3.8	7.1	12.2	23.4	45.8
100	500	1.3	2.5	3.7	7.2	16.0
	1,000	1.8	3.5	5.5	10.0	22.0
	2,000	2.6	4.9	8.0	16.0	32.0
	3,500	3.7	7.0	12.0	23.0	45.0
120	500	—	2.4	3.5	6.9	15.4
	1,000	—	3.4	5.2	9.7	21.4
	2,000	—	4.8	7.8	15.7	31.4
	3,500	—	6.9	11.8	22.7	44.4
160	500	—	—	3.4	6.6	14.8
	1,000	—	—	5.2	9.4	20.8
	2,000	—	—	7.7	15.4	30.8
	3,500	—	—	11.7	22.4	43.8

Unit: cNm

Note: The values in this table vary depending on the working conditions and are for reference purposes only. The upper limit is 20 % above the value in this table.

11. DSC-P0-M

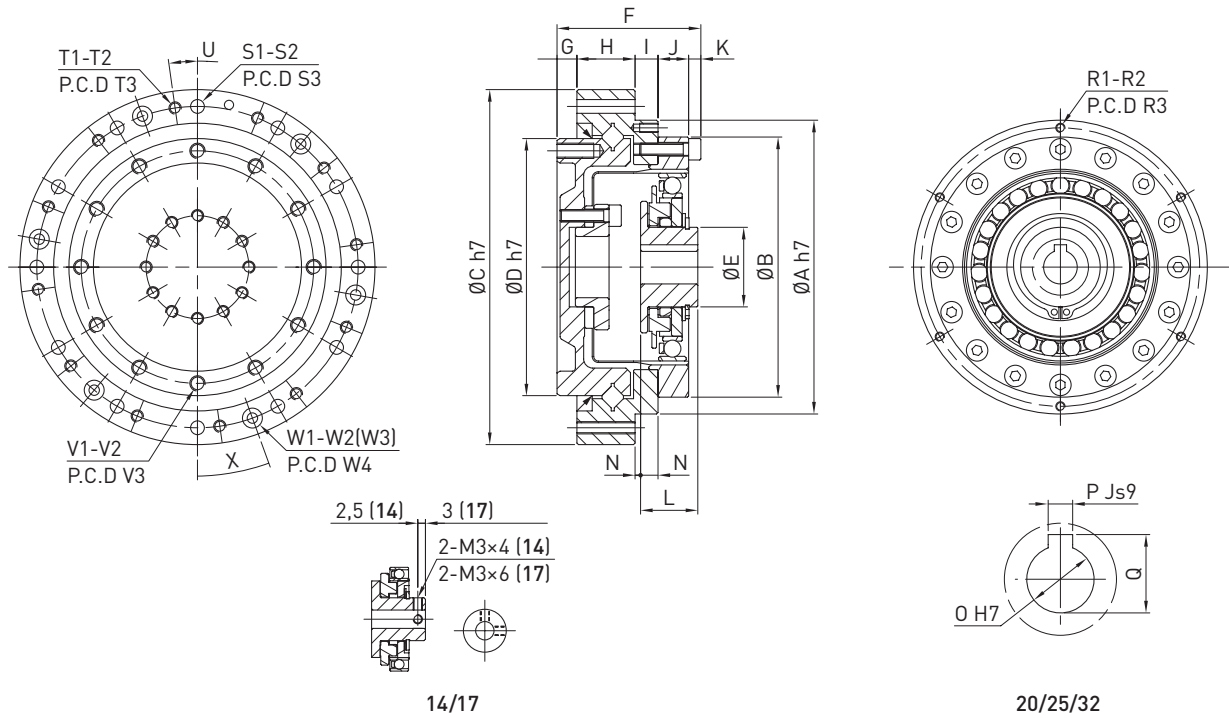


Table 11.1 Dimensions of DSC-P0-M strain wave gears

	Unit	Model/size				
		14	17	20	25	32
ØA h7	mm	60	72	82	96	125
ØB	mm	50 ^{+0.01} _{-0.015}	60 ^{+0.01} _{-0.02}	70 ^{+0.01} _{-0.02}	85 ^{+0.01} _{-0.025}	110 ^{+0.01} _{-0.025}
ØC h7	mm	78	88	98	116	148
ØD h7	mm	49	59	69	84	110
ØE	mm	14	18	21	26	26
F	mm	30	34	40	47	59
G	mm	5.0	5.0	5.7	6.5	6.5
H	mm	12.0	13.5	17.2	19.0	24.0
I	mm	4.0	6.0	6.6	7.5	9.5
J	mm	6.0	6.5	7.5	10.0	14.0
K	mm	3	3	3 ⁰ _{-0.1}	4	5
L	mm	17.6 ⁰ _{-0.1}	19.5 ⁰ _{-0.1}	20.1	20.2 ⁰ _{-0.1}	22.0 ⁰ _{-0.1}
M (flange type A)	mm	6.6 ^{+0.4} ₀	7.0 ^{+0.45} ₀	8.1 ^{+0.5} ₀	7.2 ^{+0.5} ₀	6.0 ^{+0.55} ₀
N (flange type B)	mm	2.6 ^{+0.4} ₀	1.0 ^{+0.45} ₀	1.5 ^{+0.5} ₀	0.3 ⁰ _{-0.5}	3.5 ⁰ _{-0.55}
ØO H7	mm	6	8	9	11	14
P Js9	mm	—	—	3	4	5
Q	mm	—	—	10.4 ^{+0.1} ₀	12.8 ^{+0.1} ₀	16.3 ^{+0.1} ₀
R1	mm	6	6	6	6	6
R2	mm	M2.5 × 4DP	M3 × 6DP	M3 × 6DP	M3 × 6DP	M4 × 8DP
R3 (P.C.D)	mm	55	66	76	91	118
S1	mm	8	12	12	12	12
ØS2	mm	3.4	3.4	3.4	4.5	5.5
S3 (P.C.D)	mm	68	80	89	105	135
T1	mm	8	12	12	12	12
T2	mm	M3 × 7.8DP	M3	M3	M4	M4
T3 (P.C.D)	mm	68	80	89	105	135
U	Degree	15	10	10	8	10

DATORKER® strain wave gears

DSC-PO-M

Table 11.1 Dimensions of DSC-PO-M strain wave gears

	Unit	Model/size				
		14	17	20	25	32
V1	mm	12	12	12	12	12
V2	mm	M3 × 6DP	M4 × 8DP	M4 × 8DP	M5 × 10DP	M6 × 10DP
V3 (P.C.D)	mm	43	52	62	76	96
W1	mm	4	6	6	6	6
W2	mm	Ø5.5 × 3DP	Ø5.5 × 3DP	Ø5.5 × 3DP	Ø6.5 × 3.4DP	Ø8 × 4.4DP
ØW3	mm	2.9	2.9	2.9	3.4	4.5
W4 (P.C.D)	mm	68	78	88	105	135
X	Degree	30	20	20	20	20
Moment of inertia	×10 ⁻⁴ kgm ²	0.033	0.079	0.193	0.413	1.690
Weight	kg	0.54	0.79	1.30	1.95	3.90

11.1 DSC-PO-M design

11.1.1 Technical data

Table 11.2 Crossed roller bearing specifications

Model/size	Centre circle diameter of the rollers	Offset	Basic load ratings		Permitted torque	Moment rigidity
	Dpw	R	Dynamic load C _{dyn}	Static load C ₀		
	m	m	kN	kN	Nm	×10 ⁴ Nm/rad
14	0.0465	0.014	8.25	11.4	73	7.9
17	0.0590	0.014	10.70	14.8	114	13.7
20	0.0700	0.016	21.00	27.0	172	24.0
25	0.0880	0.018	21.80	35.8	254	39.2
32	0.1140	0.020	34.50	59.0	578	120.3

Table 11.3 Accuracy of angular transmission

Reduction ratio		Model/size				
		14	17	20	25	32
50 – 160	×10 ⁻⁴ rad	4.4	4.4	2.9	2.9	2.9

Table 11.4 Hysteresis loss

Reduction ratio		Model/size				
		14	17	20	25	32
50	×10 ⁻⁴ rad	5.8	5.8	5.8	5.8	5.8
80 – 160	×10 ⁻⁴ rad	2.9	2.9	2.9	2.9	2.9

Table 11.5 Starting torque

Reduction ratio		Model/size				
		14	17	20	25	32
50		4.1	6.1	7.8	15.0	31
80		2.8	4.0	4.9	9.2	19
100		2.5	3.4	4.3	8.0	18
120		—	3.1	3.8	7.3	15
160		—	—	3.3	6.3	14

Unit: cNm

Note: The values in this table vary depending on the working conditions and are for reference purposes only. The upper limit is 20 % above the value in this table.

Table 11.6 Reverse starting torque

Reduction ratio		Model/size				
		14	17	20	25	32
50		1.6	3.0	4.7	9.0	18
80		1.6	3.0	4.8	9.1	19
100		1.8	3.3	5.1	9.8	20
120		—	3.5	5.5	11.0	22
160		—	—	6.4	13.0	26

Unit: Nm

Note: The values in this table vary depending on the working conditions and are for reference purposes only. The upper limit is 20 % above the value in this table.

Table 11.7 Torsional rigidity

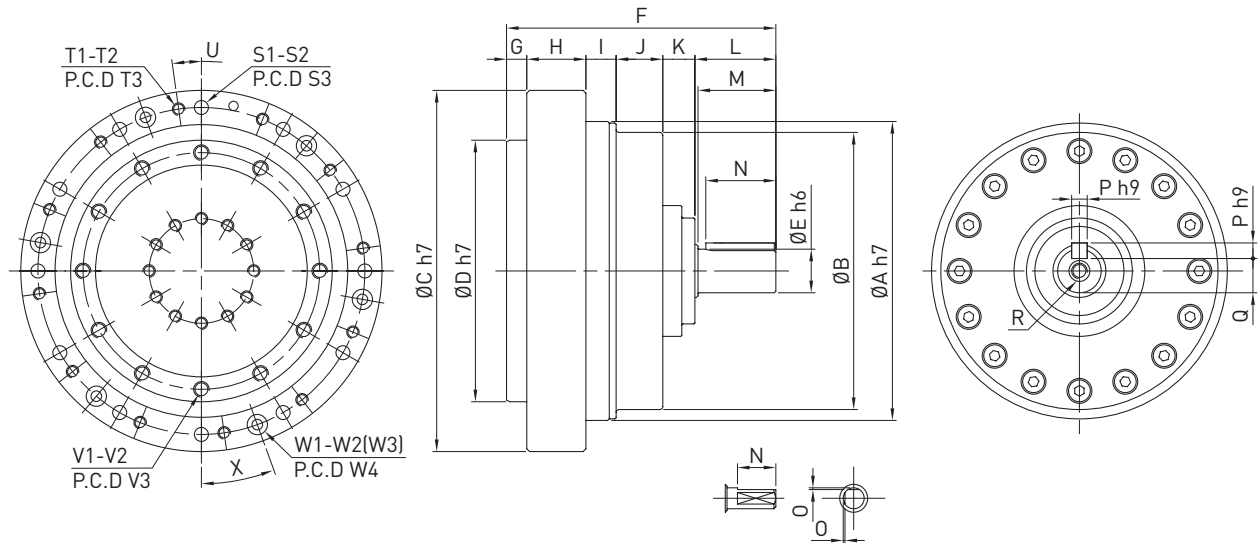
Reduction ratio			Model/size				
			14	17	20	25	32
T1		Nm	2.0	3.9	7.0	14.0	29.0
T2		Nm	6.9	12.0	25.0	48.0	108.0
50	K ₁	$\times 10^4$ Nm/rad	0.34	0.81	1.30	2.50	5.40
	K ₂	$\times 10^4$ Nm/rad	0.47	1.10	1.80	3.40	7.80
	K ₃	$\times 10^4$ Nm/rad	0.57	1.30	2.30	4.40	9.80
	θ_1	$\times 10^{-4}$ rad	5.8	4.9	5.2	5.5	5.5
	θ_2	$\times 10^{-4}$ rad	16.0	12.0	15.4	15.7	15.7
80 – 160	K ₁	$\times 10^4$ Nm/rad	0.47	1.00	1.60	3.10	6.70
	K ₂	$\times 10^4$ Nm/rad	0.61	1.40	2.50	5.00	11.00
	K ₃	$\times 10^4$ Nm/rad	0.71	1.60	2.90	5.70	12.00
	θ_1	$\times 10^{-4}$ rad	4.1	3.9	4.4	4.4	4.4
	θ_2	$\times 10^{-4}$ rad	12.0	9.7	11.3	11.1	11.6

The values are for reference purposes only. The lower limit is 20 % below the value in this table.

DATORKER® strain wave gears

DSC-AJ-M

12. DSC-AJ-M



14/17

Table 12.1 Dimensions of DSC-AJ-M strain wave gears

	Unit	Model/size				
		14	17	20	25	32
ØA h7	mm	60	72	82	96	125
ØB	mm	53	64	74	89	116
ØC h7	mm	78	88	98	116	148
ØD h7	mm	49	59	69	84	110
ØE h6	mm	6	8	10	14	14
F	mm	55.0	61.0	73.5	86.5	100.5
G	mm	5.0	5.0	5.7	6.5	6.5
H	mm	12.0	13.5	17.2	19.0	24.0
I	mm	5.7	8.2	8.8	9.7	12.7
J	mm	9.8	9.8	11.5	15.0	20.0
K	mm	7.5	8.0	9.3	10.3	11.3
L	mm	15	17	21	26	26
M	mm	14	16	20	25	25
N	mm	11.0	12.0	16.5	22.5	22.5
ØO	mm	0.5	0.5	—	—	—
P h9	mm	—	—	3	5	5
Q	mm	—	—	8.2 ⁰ _{-0.1}	11.0 ⁰ _{-0.1}	11.0 ⁰ _{-0.1}
R	mm	—	—	M3 × 6DP	M5 × 10DP	M5 × 10DP
S1	mm	8	12	12	12	12
ØS2	mm	3.4	3.4	3.4	4.5	5.5
S3 (P.C.D)	mm	68	80	89	105	135
T1	mm	8	12	12	12	12
T2	mm	M3 × 7.8DP	M3	M3	M4	M4
T3 (P.C.D)	mm	68	80	89	105	135
U	Degree	15	10	10	8	10
V1	mm	12	12	12	12	12
V2	mm	M3 × 6DP	M4 × 8DP	M4 × 8DP	M5 × 10DP	M6 × 10DP
V3 (P.C.D)	mm	43	52	62	76	96
W1	mm	4	6	6	6	6
W2	mm	Ø5.5 × 3DP	Ø5.5 × 3DP	Ø5.5 × 3DP	Ø6.5 × 3.4DP	Ø8 × 4.4DP

Table 12.1 Dimensions of DSC-AJ-M strain wave gears

	Unit	Model/size				
		14	17	20	25	32
ØW3	mm	2.9	2.9	2.9	3.4	4.5
W4 (P.C.D)	mm	68	78	88	105	135
X	Degree	30	20	20	20	20
Moment of inertia	$\times 10^{-4} \text{ kgm}^2$	0.025	0.059	0.137	0.320	1.200
Weight	kg	0.64	0.95	1.40	2.50	5.40

12.1 DSC-AJ-M design

12.1.1 Technical data

Table 12.2 Crossed roller bearing specifications

Model/size	Centre circle diameter of the rollers	Offset	Basic load ratings		Permitted torque	Moment rigidity
	Dpw	R	Dynamic load C_{dyn}	Static load C_0		
	m	m	kN	kN	Nm	$\times 10^4 \text{ Nm/rad}$
14	0.0465	0.014	8.25	11.4	73	7.9
17	0.0590	0.014	10.70	14.8	114	13.7
20	0.0700	0.016	21.00	27.0	172	24.0
25	0.0880	0.018	21.80	35.8	254	39.2
32	0.1140	0.020	34.50	59.0	578	120.3

Table 12.3 Accuracy of angular transmission

Reduction ratio		Model/size				
		14	17	20	25	32
50 – 160	$\times 10^{-4} \text{ rad}$	4.4	4.4	2.9	2.9	2.9

Table 12.4 Hysteresis loss

Reduction ratio		Model/size				
		14	17	20	25	32
50	$\times 10^{-4} \text{ rad}$	5.8	5.8	5.8	5.8	5.8
80 – 160	$\times 10^{-4} \text{ rad}$	2.9	2.9	2.9	2.9	2.9

Table 12.5 Starting torque

Reduction ratio		Model/size				
		14	17	20	25	32
50		5.7	9.7	14.0	22	41
80		4.4	7.2	11.0	15	29
100		3.7	6.5	9.9	14	27
120		—	6.2	9.3	13	24
160		—	—	8.6	12.0	23.0

Unit: cNm

Note: The values in this table vary depending on the working conditions and are for reference purposes only. The upper limit is 20% above the value in this table.

DATORKER® strain wave gears

DSC-AJ-M

Table 12.6 Reverse starting torque

Reduction ratio		Model/size				
		14	17	20	25	32
50		3.4	5.8	8.4	13	25
80		4.2	6.9	10.0	15	28
100		4.5	7.8	12.0	17	33
120		—	8.9	13.0	19	34
160		—	—	17.0	23.0	43.0

Unit: Nm

Note: The values in this table vary depending on the working conditions and are for reference purposes only. The upper limit is 20 % above the value in this table.

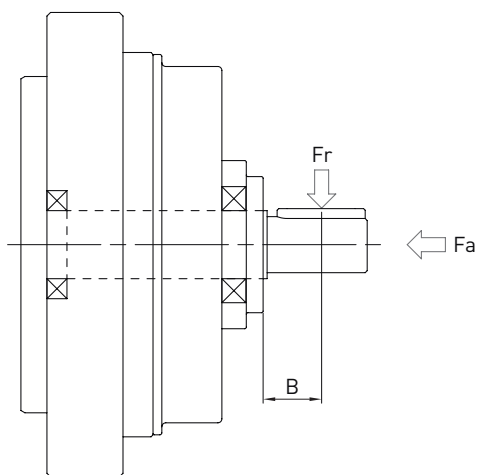
Table 12.7 Torsional rigidity

Reduction ratio			Model/size				
			14	17	20	25	32
T1		Nm	2.0	3.9	7.0	14.0	29.0
T2		Nm	6.9	12.0	25.0	48.0	108.0
50	K ₁	×10 ⁴ Nm/rad	0.34	0.81	1.30	2.50	5.40
	K ₂	×10 ⁴ Nm/rad	0.47	1.10	1.80	3.40	7.80
	K ₃	×10 ⁴ Nm/rad	0.57	1.30	2.30	4.40	9.80
	θ ₁	×10 ⁻⁴ rad	5.8	4.9	5.2	5.5	5.5
	θ ₂	×10 ⁻⁴ rad	16.0	12.0	15.4	15.7	15.7
80 – 160	K ₁	×10 ⁴ Nm/rad	0.47	1.00	1.60	3.10	6.70
	K ₂	×10 ⁴ Nm/rad	0.61	1.40	2.50	5.00	11.00
	K ₃	×10 ⁴ Nm/rad	0.71	1.60	2.90	5.70	12.00
	θ ₁	×10 ⁻⁴ rad	4.1	3.9	4.4	4.4	4.4
	θ ₂	×10 ⁻⁴ rad	12.0	9.7	11.3	11.1	11.6

The values are for reference purposes only. The lower limit is 20 % below the value in this table.

12.1.2 Permissible input load

To ensure proper operation of the reducer, please check the load applied to the input section. As shown below:



F_a Radial load

F_r Axial load

B Offset (see Table 12.8)

The following figure shows the average input speed of 2,000 rpm and the basic nominal service life $L_{10} = 7,000$ hours.

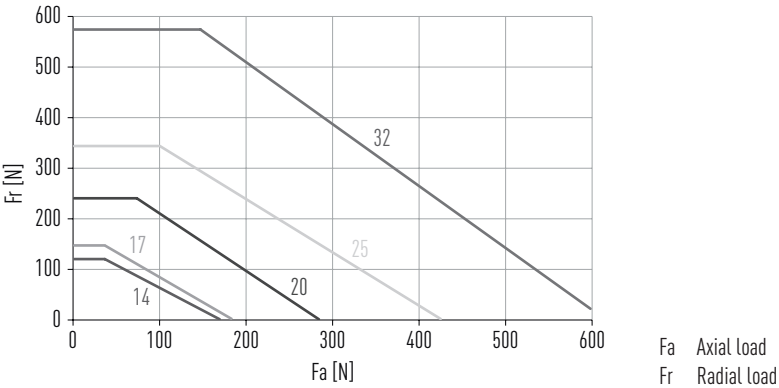


Table 12.8 Maximum radial load and offset (B)

		Model/size				
		14	17	20	25	32
Offset (B)	mm	7.0	8.0	10.0	12.5	12.5
Max. radial load	N	118	145	232	342	567